Space Support Element Toolkit – Light

U. S. Army Space and Missile Defense Command
Space and Missile Defense Battle Lab

SSET-L Introduction

In order to achieve full spectrum dominance, warfighters must apply combat power to, through, and from space while assuring full friendly exploitation of space-based capabilities. Rapid growth in space-based resources and technology is leading to exponentially greater capabilities available for support to warfighters. In response to this tremendous growth, the Space and Missile Defense Battle Lab-Space Directorate (SMDBL-W) created a suite of equipment that includes the Space Enhancement Tool Suite of the FA-40 Space Operations System (SOS) and the communications capabilities of the Space Applications Technology Utility Research Network (SATURN) Earth Terminal (SET). The SSET-L is comprised of two SOS systems and one SET system with associated peripherals and service packages. Integrating Commercial-off-the-Shelf (COTS) components allowed for rapid acquisition, product tailoring, and the integration of emerging technologies. Systems were successfully deployed with Army Space Support Teams (ARSST) and Joint Space Support Teams (JSST) in support of Operation Enduring Freedom, Operation Iraqi Freedom, and current military operations.

SSET-L System Overview

- Space Operations System (2) with repair parts
  - Space analysis, space situational awareness, imagery
- IP SATCOM with dish
  - 2MB Downlink/256kb Uplink (scaleable), Ku Band
- IRIDIUM MT9505 with secure sleeve
  - Secure backup communications
- INMARSAT/Vocality
  - Multiplexed (5 concurrent operations), 64kb C Band
- Man Machine Interface (MMI)
  - Diagnostic and maintenance for communications equipment
- Encryption
  - KG235 Inline Network Encryption Device
- Uninterruptible Power Supply
- Antenna
  - Either 1.2 or 1.8M (depends on destination of user)

Description

The architecture of the SSET-L provides connectivity between the Space and Missile Defense Operations Center (SMDCOC) and remote sites with a triple redundant space based communications suite that utilizes INMARSAT, Iridium and Internet Protocol Satellite (IPSAT) services.

The IPSAT capability for the SSET-L is made possible through the use of an iDirect NetModem with Internet connectivity provided by Segovia International. The IPSAT capability is the backbone of the SSET-L's broadband communications. It operates in the Ku frequency band and provides 1Mbps downlink to the remote earth terminal and up to 256kbs uplink capability back to the Internet. Rates can be increased dependent upon factors such as the geographical location of the terminal and antenna size. The data stream is encrypted by a KG-235 Inline Network Encryption (INE) device.

Iridium 9505 Satellite phone provides voice and low data rate global communications capability. The Iridium Secure Module (ISM) is included with the phone providing secure voice communications.

Additional voice and data communications are provided by the Vortex Integrated Storm V-100 International Maritime Satellite Service (INMARSAT) terminal. The terminal provides a 64kbps synchronous link over the C commercial frequency band. The Vortex's multiplexing capability allows for up to five concurrent communications operations using the single 64kb channel with no increase over basic cost per minute subscription service. Each terminal is currently integrated with the home station PBX and appears to the forward deployed users as a home station phone call.

The Space Operations System (SOS) is a portable computer system designed for space analysis and situational awareness. The SOS is also capable of imagery production (ex. Fly-through, 3D perspectives, 2D images etc.) and limited imagery analysis. Applications run on a WINTEL operating system for ease of use and training and are accredited to operate in unclassified and classified environments. The user is provided with classified and unclassified drives and can connect to NIPRNET/SIPRNET or work in a stand-alone mode.

Benefit to the Warfighter

The SSET-L is designed as an easily deployable and globally capable tool-set to support Army and Joint Space Operations. The system provides global "reachback" broadband communication that supports forward deployed space soldiers who provide space services (e.g. analysis, estimate, IPB etc.) and products (e.g. commercial imagery) to support operational commanders.

System Features Include:

- 100 percent COTS system
- Rapid and easily deployable
- Global "reachback" communications capabilities
- "One-stop" support center for deployed space forces
- Provides triple redundancy for the user
- Portable computer system designed for space analysis
- Each system deploys with organic satellite installation kit
- Five-tier support system
- Deployed with basic repair parts

Demonstrations

August 2003-Space and Missile Defense Conference in Huntsville, Ala.
October 2003-AUSA Symposium in Washington, D.C.
December 2003-AUSA Symposium in El Paso, Texas
April 2004-Space Symposium in Colorado Springs, Colo.

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